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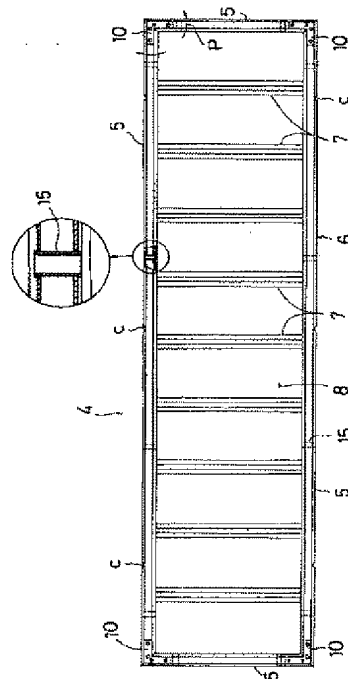
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(54)【発明の名称】 枠材とその枠材を用いたコンクリート型枠

(57)【要約】

【目的】 枠材どうしと、枠材と補強用中棧との、それぞれの接合部の精度及び強度を向上でき、かつ、使用上で変形した場合の枠材や補強用中棧の部分的な交換が容易で、使用寿命が大幅にアップしたコンクリート型枠を提供する。

【構成】 枠材5の隣合うものの凹部11にわたって嵌め込んだ枠材連結部材10と、補強用中棧7と枠材5との凹部13、16にわたって嵌め込んだ中棧連結部材17を、それぞれ緊結手段a、dによって連結し、これらを金属製にしてパネル材8の周縁部に設け、かつ、中棧連結用の枠材5には中棧端部の係止部18を設けてある。



【特許請求の範囲】

【請求項 1】 パネル材の一側面に設けられ且つ隣合うものが互いに桷材連結部材を介して緊結手段により連結されてコンクリート型桷材を構成する金属製の桷材であって、少なくとも一面に前記桷材連結部材の嵌め込み凹部を設けてあることを特徴とする桷材。

【請求項 2】 補強用中棧と共にパネル材の一側面の周縁部に設けられてコンクリート型桷材を構成する金属製の桷材であって、前記補強用中棧の端部を係止する中棧係止部を設けてあることを特徴とする桷材。

【請求項 3】 少なくとも一面に桷材連結部材の嵌め込み凹部を設けた桷材を、パネル材の一側面の周縁部に設けると共に、この桷材の隣合うものの凹部にわたって桷材連結部材を嵌め込み、かつ、この桷材連結部材と前記桷材とを緊結手段によって連結してあることを特徴とするコンクリート型桷材。

【請求項 4】 少なくとも一面に桷材連結部材の嵌め込み凹部を設けた桷材を、パネル材の一側面の周縁部に設けると共に、この桷材の隣合うものの凹部にわたって桷材連結部材を嵌め込み、かつ、この桷材連結部材と前記桷材とを緊結手段によって連結する一方、相対峙する所定の桷材にわたる補強用中棧と桷材のそれぞれに中棧連結部材の嵌め込み凹部を設け、この凹部に嵌め込んだ中棧連結部材を緊結手段によって補強用中棧と桷材とに連結すると共に、中棧連結用の桷材には、中棧端部の係止部を設けてあることを特徴とするコンクリート型桷材。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、コンクリート製の壁や柱、梁、床などを構築するためのコンクリート型桷材に用いられる桷材、及び、桷材からなるコンクリート型桷材に関する。

【0002】

【従来の技術】コンクリート製の壁や柱、床などを構築するためのコンクリート型桷材として、互いに隣合う例えばアルミなどの金属製の桷材を溶接により連結し組み立て、必要に応じて、同じく例えばアルミなどの金属製の補強用中棧を相対峙する桷材にわたって溶接により連結し、これをパネル材の裏面の周縁部に取り付けたものが知られている。

【0003】かかる構成のコンクリート型桷材によれば、金属製にもかかわらず比較的軽量でかつ桷材の剛性を確保でき、これまでの木製の桷材によって製作されたコンクリート型桷材に比べて、使用回数を増大できる利点を有する。

【0004】

【発明が解決しようとする課題】しかしながら、従来では、桷材どうしの連結や桷材に対する補強用中棧の連結を、溶接に頼る形態をとっているために、溶接熱による桷材や中棧の歪みを防止する高度の溶接技術を必要とす

る問題があった。また、全ての桷材や中棧が溶接によって連結されているため、型桷使用時に桷材や中棧の一部が変形した場合、これらを部分的に交換することができないためにコンクリート型桷材の全てを廃棄することとなり、コスト的に高く付く問題があった。

【0005】上記の問題を解決する上で、桷材連結部材や中棧連結部材を介して且つ例えばリベットによって、桷材どうしを連結したり或いは桷材に補強用中棧を連結したりすることが考えられるのであるが、連結部材を介して単にリベットで連結する形態では、コンクリート型桷材使用時の応力に対する桷材ならびに中棧の変形耐力・剪断耐力はリベットの耐力によって決まってしまう問題がある。

【0006】かかる実情に鑑みて本発明は、アルミ製や銅製など金属製の桷材からなるコンクリート型桷材、或いは必要に応じて補強用中棧が設けられるコンクリート型桷材を容易に組み立てることができ、かつ、剛性ならびに耐久性が高く、しかも桷材や中棧の部分的な交換が可能なコンクリート型桷材に用いられる桷材と、その桷材を用いたコンクリート型桷材を提供することを目的としている。

【0007】

【課題を解決するための手段】上記の目的を達成するに至った第 1 発明による桷材は、パネル材の一側面に設けられ且つ隣合うものが互いに桷材連結部材を介して緊結手段により連結されてコンクリート型桷材を構成する金属製の桷材であって、少なくとも一面に前記桷材連結部材の嵌め込み凹部を設けた点に特徴がある。

【0008】第 2 発明による桷材は、補強用中棧と共にパネル材の一側面の周縁部に設けられてコンクリート型桷材を構成する金属製の桷材であって、前記補強用中棧の端部を係止する中棧係止部を設けた点に特徴がある。

【0009】第 3 発明および第 4 発明は、上記の型桷材を用いて構成されるコンクリート型桷材に係るものであって、第 3 発明による少なくとも一面に桷材連結部材の嵌め込み凹部を設けた桷材を、パネル材の一側面の周縁部に設けると共に、この桷材の隣合うものの凹部にわたって桷材連結部材を嵌め込み、かつ、この桷材連結部材と前記桷材とを緊結手段によって連結した点に特徴がある。

【0010】第 4 発明によるコンクリート型桷材は、少なくとも一面に桷材連結部材の嵌め込み凹部を設けた桷材を、パネル材の一側面の周縁部に設けると共に、この桷材の隣合うものの凹部にわたって桷材連結部材を嵌め込み、かつ、この桷材連結部材と前記桷材とを緊結手段によって連結する一方、相対峙する所定の桷材にわたる補強用中棧と桷材のそれぞれに中棧連結部材の嵌め込み凹部を設け、この凹部に嵌め込んだ中棧連結部材を緊結手段によって補強用中棧と桷材とに連結すると共に、中棧連結用の桷材には、中棧端部の係止部を設けた点に特徴

がある。

【0011】

【作用】第1発明の枠材によれば、コンクリート型枠使用時に生じる応力の一部を、枠材の隣合うものの凹部にわたって嵌め込まれる枠材連結部材に負担させることができるので、リベット等の緊結手段の構造耐力のみに依存することなく枠材どうしを連結でき、枠材の連結部の精度及び強度を向上できる。

【0012】第2発明の枠材によれば、枠材と補強用中棧との連結部に生じる剪断力を、中棧連結部材を介して枠材に容易に伝達できるので、その連結部の精度及び強度を向上できる。

【0013】第3発明のコンクリート型枠によれば、枠材の連結部の精度及び強度を向上でき、しかも、その連結がリベット等の緊結手段によるので、枠材の部分的な交換が容易に可能となる。

【0014】第4発明のコンクリート型枠によれば、枠材の連結部はもとより、枠材と補強用中棧との連結部の精度及び強度を向上でき、しかも、その連結がリベット等の緊結手段によるので、枠材ならびに補強用中棧の部分的な交換が容易に可能となる。

【0015】

【実施例】以下、本発明の実施例を図面に基づいて説明する。図1は柱まわりの型枠構造を示し、柱成型用型枠1の横側部に、梁成型用型枠2と壁成型用型枠3を連結している。

【0016】これらの型枠1～3を構成する単体の板状のコンクリート型枠4は、図2にも示すように、押し出しや引き抜きによって成形されたアルミ製の枠材5を方形に連結して枠6を形成し、この枠6の枠空間を区画するように、同じく押し出しや引き抜きによって成形されたアルミ製の補強用中棧7を、互いに相対峙する長尺の枠材5、5間にわたって一体に設け、これら枠6と補強用中棧7との一側面部にコンクリート打設用の樹脂製のパネル材8を例えばリベット止めして成る。

【0017】尚、枠材5ならびに補強用中棧7を鋼製などの金属製に変更可能であり、またパネル材8も樹脂製に限られるものではなく、木製などのパネル材に変更可能である。更に、前記枠6と補強用中棧7とをパネル材8にリベット止めしているが、ビス止めやボルト・ナットによる取り付け等に変更可能である。

【0018】柱成型用型枠1のコンクリート型枠4については後述するが、梁用と壁用の型枠2、3に用いる枠材5と補強用中棧7、及び、これらを用いて構成されるコンクリート型枠4の具体的構造を、図2～4に基づいて説明する。

【0019】先ず、枠6を構成する枠材5について、この枠材5は、断面が中空の矩形状を呈するものであって、そのパネル材付設側の一側面部に、前記樹脂製パネル材8の端縁を保護するためのパネル材保護部材9を

連結して、取り扱いの面でダメージを受け易いパネル材端部を保護するようにしている。

【0020】そして、各枠材5の両端部を斜め45度に切断して突き合わせ、かつ、前記パネル材付設側とは反対側の他側面部において、L字状に形成された板状の枠材連結部材10を隣合う枠材5、5にわたってリベットa止めすることで、上記した方形の枠6を構成するのであるが、このリベットaを介しての枠材連結部材10による枠材5、5の連結に際して、枠材連結部材10を単に枠材5の他側面部に当接させてリベットa止めする形態をとると、隣合う枠材5、5に開きの応力（図2に矢付Pで示す応力）がかかったときにリベットaに過大の剪断力がかかることから、このリベットaを強度の高いものにすることが必要である。

【0021】かかる実情に鑑みて本発明では、枠材5のパネル材付設側とは反対側の他側面部に、枠材連結用の板状の枠材連結部材10を可及的に密に嵌め込む凹部11を形成して、この嵌め込み凹部11に枠材連結部材10を嵌め込ませ、隣合う枠材5、5の開きによる応力を、この枠材連結部材10と凹部11とによる嵌合部で受け止めさせるようにした上で、前記枠材連結部材10を枠材5にリベットa止めし、枠6の剛性を高めるようにしている。

【0022】上記構成の枠6の剛性を更に高めるために、前記枠材5の枠空間形成側の内側面部に、板状の部材をL字状に屈曲成形して成る枠材連結部材12の嵌め込み凹部13を形成して、傾斜端部を突き合わせて隣合う枠材5、5の凹部13、13にわたって枠材連結部材12を嵌め込み、かつ、これを各枠材5にリベットb止めして、このリベットbに剪断力をかけさせないで、隣合う枠材5、5のパネル面に直交する方向への位置ずれ防止を図っている。

【0023】尚、枠材5の枠空間形成側の面部とは反対側の外側面部に凹入部14を設けると共に、隣合う枠6、6間にセパレーター（詳細は、図8、9に基づいて後述する。）の軸足挿通孔を形成するための孔用凹部cを、前記凹入部14両側の隆状部の所定箇所に形成している。このように、枠材5の外側面部に凹入部14を設けておいて、その両側の隆状部に孔用凹部cを形成する手段をとれば、孔加工を簡易に行うことができる。

【0024】また、各枠材5の所定箇所には、図2に一部を拡大して図示するように、内側と外側の面部とを貫通させるようにして、例えば溶接やカシメ止めの手段でパイプ部材15が設けられている。

【0025】一方、補強用中棧7は、前記樹脂製パネル材8を支持するワイドなフランジ7aにウエップ7bを連結したT字形状を呈するものであって、このウエップ7bにも、前記枠材5の内側面部に形成された凹部13に連ねる状態で凹部16を形成し、かつ、板状の部材をL字状に屈曲成形して成る中棧連結部材17を両凹部

13、16にわたって嵌め込んで、これを枠材5と補強用中棧7とにリベットd止めしている。そして、前記枠材5の枠空間形成側の内側面部で且つパネル材付設側とは反対側の部位に、前記補強用中棧7のウェーブ7bの端部を係止する中棧係止部材18を連設している。

【0026】かかる連結構成をとることによって、コンクリートの打設によって補強用中棧7にかかる応力が、前記中棧連結部材17ならびに中棧係止部材18を介して枠材5で受け止められることになり、而して、前記リベットdには剪断力がかからなくなることから、前記枠材5と補強用中棧7との連結部の強度アップが達成される。

【0027】上記構成のコンクリート型枠4の隣合うものは、図5に示す棒状クリップ19によって連結される外に、図6に示す固定機構21によっても連結される。

【0028】棒状クリップ19は、隣合う枠材5、5のパイプ部材15に挿通される棒状部分19aの一端側に、中棧係止部材18に係止して隣合う枠材5、5を弾性的に挟着するコの字状の棒状部分19bを折り曲げ連設して成るもので、前記棒状部分19bをパイプ部材15に挿通すると共に、クリップ19の全体を下方に回動させて、コの字状の棒状部分19bを中棧係止部材18に係止させることで、隣合うコンクリート型枠4、4をワンタッチで連結できるようになっている。

【0029】固定機構21は、隣合うコンクリート型枠4、4の一方の枠材5の凹部13に対する係止具eを備えた第1係止部材22と、他方の枠材5の凹部13に対する係止具nを備えた第2係止部材24とを、上下方向のピン23を介して回動自在に連結すると共に、前記係止具e、nを互いに接近させる方向に第1及び第2の係止部材22、24を回動させるカム機構28を設けて成る。尚、カム機構28は、第1係止部材22に形成のカム溝26と、このカム溝26に係入打設されて前記第2係止部材24を第1係止部材22側に揺動させるカム部材27とからなる。また、前記他方の係止具nは、上下方向のピン25まわりで回動自在に第2係止部材24に連結されている。

【0030】上記の棒状クリップ19による隣合うコンクリート型枠4、4どうしの連結に際して、その隣合うコンクリート型枠4、4を所定の高さ位置にレベル出しすることが肝要であり、そのためのレベル調整手段20をコンクリート型枠4の下部側に設けている。

【0031】このレベル調整手段20は、図7に示すように、横向きのL字状部材35を、コンクリート型枠4の下部側の枠材5に対して、その下面部と中棧係止部材18とに係止保持させると共に、枠材5側のパイプ部材15と同芯状にナット36と透孔fとを設け、かつ、前記ナット36にレベル調整用ボルト37を螺合させて成るもので、コンクリート型枠4のレベル調整に際しては、ライナー38を介して型枠設置面部に配置されたア

ングル部材39に、前記レベル調整用のボルト37の下端を当て付けて、このボルト37の螺進調整によってコンクリート型枠4のレベル調整が行われる。

【0032】互いに相対峙して設置されるコンクリート型枠4、4は、図8に示す連結手段29によって施工性のよい状態で簡易に連結される。この連結手段29は、所謂セパレーター（内部に金属製の雌ねじ部が埋め込まれたコーン状の部材30と、このコーン状部材30を両端に螺合して型枠間隔を規制する間隔規制部材31と、各コーン状部材30に螺合される軸足32の三者から成る）41と、隣合う枠6にわたって中棧係止部材18に係止される受け座33、及び、軸足32のそれぞれに螺合されるナット34から成り、相対峙するコンクリート型枠4、4の連結は例えば次のようにして行われる。

【0033】即ち、所定の箇所に壁配筋を施工した後、図9に示すように、壁幅方向の一方で隣合うコンクリート型枠4a、4aを順次建て込み、図7に示したレベル調整手段20によってレベル調整した上で、図5、6に示した棒状クリップ19と固定機構21とによって連結するのである。

【0034】この際、予め間隔規制部材31の両側にコーン状の部材30と軸足32を取り付けて、所謂セパレーター41を構成しておき、このセパレーター41の軸足32を挟み付けるようにして、コンクリート型枠4a、4aの建て込みを行い、かつ、一方の軸足32に受け座33をセットし、この受け座33とナット34とによって隣合うコンクリート型枠4a、4aを締め付けて、実質的にセパレーター41をコンクリート型枠4a、4a間に締め付け保持させておくのである。

【0035】このようにコンクリート型枠4a、4a間にセパレーター41を締め付け保持させる上で、隣合うコンクリート型枠4a、4a間の所定箇所に軸足挿通孔が形成されるように、前記枠材5に対する孔用凹部cの形成位置を設定しておくことが肝要である。

【0036】壁幅方向一方のコンクリート型枠4aの建て込みを終えたならば、それらのコンクリート型枠4a、4a間に保持されているセパレーター41の他方の軸足32を挟み付けるようにして、上記と同様に、レベル調整手段20によるレベル調整と棒状クリップ19と固定機構21とによる連結を行いつつ、壁幅方向他方のコンクリート型枠4bの建て込みを行うのであり、これによって、相対峙するコンクリート型枠4a、4bの連結ならびに建て込みが所定の間隔規制状態で簡易に達成されるのである。

【0037】上記の手段によれば、コンクリート型枠4a、4bの建て込みの作業性がよく、かつ、コンクリート型枠4a、4bの解体も容易に行うことができる。即ち、従来構造のセパレーターは、間隔規制部材の両側にコーン状部材を備え、かつ、このコーン状部材から突出した間隔規制部材の端部に軸足を螺合させる構成のもの

であって、コンクリート型枠の建て込みに際しては、相対峙して配置されるコンクリート型枠にわたって、その板面に間隔規制部材の端部を貫通させ、この端部に螺着される軸足に端太を設ける連結手段をとっていたのであるが、セパレーターの間隔規制部材の端部を、板面に形成した孔に挿通させつつコンクリート型枠を建て込むことは極めて困難であった。

【0038】この点にあって本発明の連結手段によれば、セパレーター41の軸足32をコンクリート型枠4a、4a、4b、4b間に締め付け保持させるので、相対峙するコンクリート型枠4a、4bの連結ならびに建て込みを作業性のよい状態で行うことができるのであり、また、コンクリート打設時の側圧によるコンクリート型枠4a、4bの開きを、剛性の高いアルミ製の枠材5で受け止めて分散させるようにしているので、従来必要として端太の省略も可能となり、かつ、コンクリート型枠4a、4bの解体も容易に達成されるのである。

【0039】次に、柱成型用型枠1のコンクリート型枠4について説明すると、図10に示すように、このコンクリート型枠4に用いられる枠材5は、樹脂製パネル材8の取り付けフランジ5aとウェーブ5bとから成る断面がL字形のアルミ製のものであって、パネル材付設側の一側面部に、前記樹脂製パネル材8の端縁を保護するためのパネル材保護部材9を連設すると共に、枠空間形成側の面部とは反対側の外側面部に凹入部14を設け、かつ、この凹入部14両側の隆状部に、相対峙するコンクリート型枠連結のための孔用凹部cを形成して成る。

【0040】そして特に図示はしないが、この枠材5を方形に連結して枠を形成し、この枠の枠空間を区画するようにアルミ製の補強用中棧を、枠の相対峙する長尺の枠材間にわたって一体に設け、これら枠と補強用中棧との一側面部に、コンクリート打設用の樹脂製パネル材を例えばリベット止めすることによって柱成型用型枠1のコンクリート型枠4が構成されるのである。

【0041】この柱成型用型枠1の隣合うコンクリート型枠4、4どうしの連結と相対峙するコンクリート型枠4、4の連結についての説明は省略するが、図5、6、8に示したクリップ19と固定機構21および連結手段29と構成的に同じもので連結が達成されることは容易に理解されよう。

【0042】尚、上記の実施例では、枠材連結部材10の嵌め込み凹部11を溝状に形成しているが、図11(A)に示すように、枠材5の全長にわたる隆状部hによって凹部11を形成したり、或いは、枠材5を押し出しや引き抜きによって成形することはできないが、図11(B)に示すように、枠材連結部材まわりに限定して凹部11を形成したり、図11(C)に示すように、枠材連結部材まわりに限定した隆状部iによって凹部11を

形成したりすることが可能である。

【0043】また、前記枠材連結部材10を、枠材5のパネル材付設側とは反対側の他側面部形成した嵌め込み凹部11に嵌め込む構成としているが、図12に示すように、端部を45度に切断して連結される枠材5の中空部分を枠材連結部材10の嵌め込み凹部11にして、この凹部11に、リベット挿通孔jが形成された中実または中空の枠材連結部材10を密に嵌め込み、かつ、枠材5には予め前記リベット挿通孔jに対応する孔mを形成しておいて、パネル材8の厚さ方向において枠材連結部材10と枠材5および樹脂製パネル材8の三者を、またはパネル材8の面方向において枠材5と枠材連結部材10の二者を、適宜たとえばリベット40で連結固定する手段をとることも可能である。

【0044】更に、枠材連結部材12を桟木枠6、6の内角における凹部13に嵌め込む構成としているが、桟木枠6、6の外角における凹入部14を枠材連結部材12の嵌め込み凹部として、ここに没入させる状態で枠材連結部材12を嵌め込む形態での実施も可能である。

【0045】また、前記枠材5ならびに補強用中棧7をアルミ製としているが、これは軽量であって取り扱いの面で優れるからであるが、これらを金属製とするならば、その金属の材質は特定されるものではなく、かつ、その断面形状を、枠材5については略口形とし、補強用中棧7については略I形としたが、I形やH形、L形、コの字形、台形、その他り形状でもよく、特定の形状に限定されるものではないことは言うまでもない。

【0046】更に、枠材5を方形に組み立てる形態の実施例を示す上で、枠材5の端部を斜め45度に切断し突き合わせを行ったが、コンクリート型枠4の形状が多角形の場合は、その形状に合わせて枠材5の端部切断角度を変えて突き合わせることも言うまでもない。

【0047】また、枠材5、5に対する枠材連結部材10、12の連結と、枠材5と補強用中棧7とに対する中棧連結部材17の連結を、いずれもリベット止めすることで説明したが、これは単に一例であって、ビス止めやボルト・ナットによる連結などに変更可能であり、本発明では、これらの連結手段を緊結手段と総称しているのである。

【0048】

【発明の効果】以上説明したように第1発明の枠材によれば、コンクリート型枠使用時に生じる応力の一部を、枠材の隣合うものの凹部にわたって嵌め込まれる枠材連結部材に負担させることができるので、リベット等の緊結手段の構造耐力のみに依存することなく枠材どうしを連結でき、枠材の連結部の精度及び強度を向上できる。

【0049】第2発明の枠材によれば、枠材と補強用中棧との連結部に生じる剪断力を、中棧連結部材を介して枠材に容易に伝達できるので、その連結部の精度及び強度を向上できる。

【0050】第3発明のコンクリート型枠によれば、枠材の連結部の精度及び強度を向上でき、しかも、その連結がリベット等の緊結手段によるので、型枠使用時に枠材の一部が変形した場合の枠材の部分的な交換が容易に可能となり、コンクリート型枠の使用寿命が大幅にアップすることで、実質的にコンクリート型枠のコストダウンが達成される。

【0051】第4発明のコンクリート型枠によれば、枠材の連結部はもとより、枠材と補強用中棧との連結部の精度及び強度を向上でき、しかも、その連結がリベット等の緊結手段によるので、型枠使用時に枠材や補強用中棧の一部が変形した場合の、これら枠材や補強用中棧の部分的な交換が容易に可能となり、コンクリート型枠の使用寿命が大幅にアップすることで、実質的にコンクリート型枠のコストダウンが達成される。

【図面の簡単な説明】

【図1】柱および梁付き壁成型用型枠の配置形態図である。

【図2】一部を取り出し且つ破断して拡大図示したコンクリート型枠の平面図である。

【図3】コンクリート型枠の主要部の斜視図である。

【図4】コンクリート型枠の一端側の縦断側面図であ

る。

【図5】棒状クリップによるコンクリート型枠の連結状態を示す斜視図である。

【図6】固定機構の詳細図である。

【図7】レベル調整手段の断面図である。

【図8】相対峙するコンクリート型枠の連結手段を示す断面図である。

【図9】相対峙するコンクリート型枠の連結手順例を示す説明図である。

10 【図10】柱成型用型枠のコンクリート型枠に用いる枠材の断面図である。

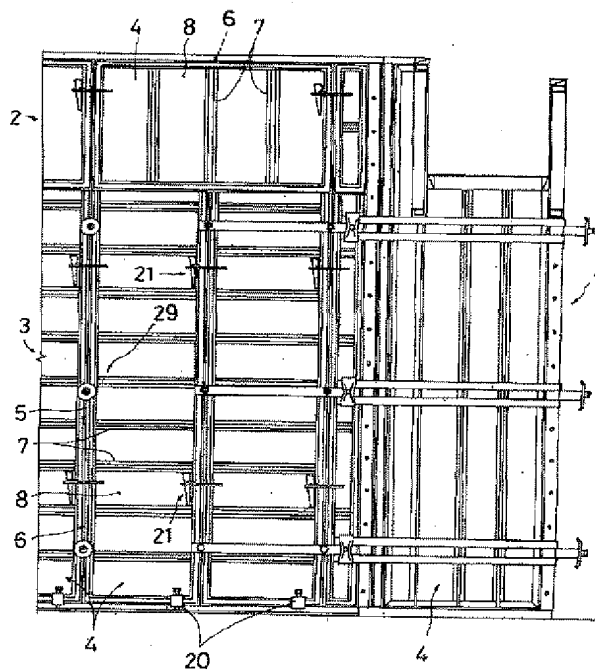
【図11】(A)、(B)、(C)はそれぞれ枠材連結部材の嵌め込み凹部を示す別実施例の部分斜視図である。

【図12】枠材連結構造の別実施例を示す分解斜視図である。

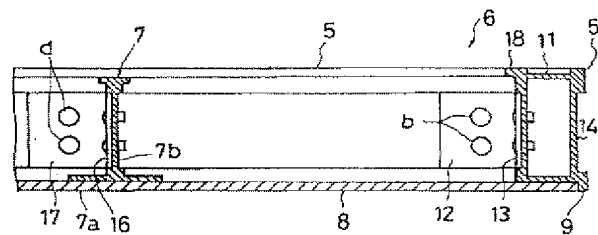
【符号の説明】

5…枠材、7…補強用中棧、8…パネル材、10、12…枠材連結部材、11、13、16…嵌め込み凹部、17…中棧連結部材、18…中棧係止部材、a、b、d…緊結手段（リベット）。

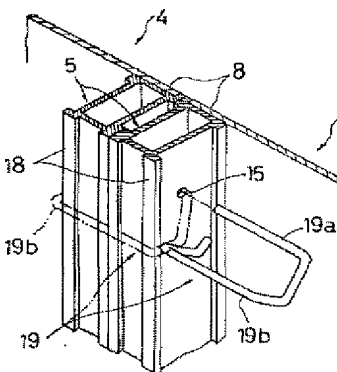
【図1】



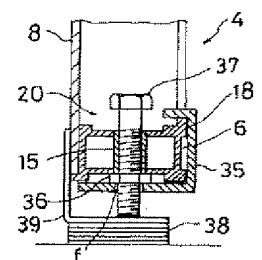
【図4】



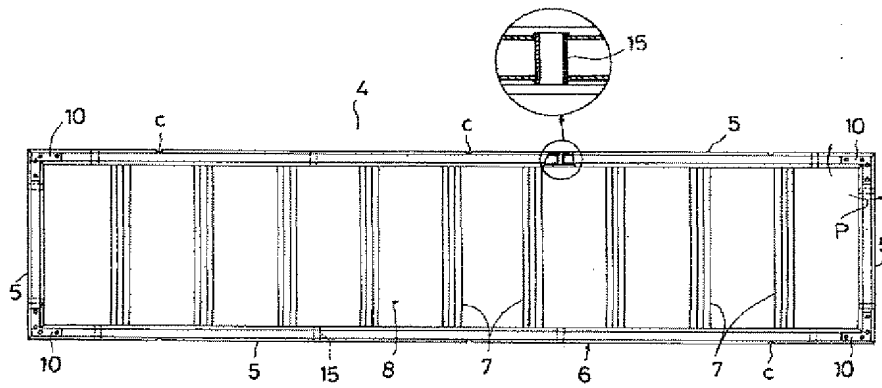
【図5】



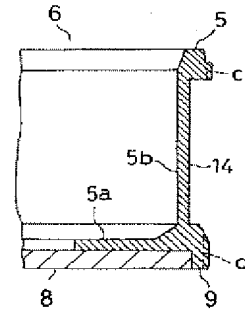
【図7】



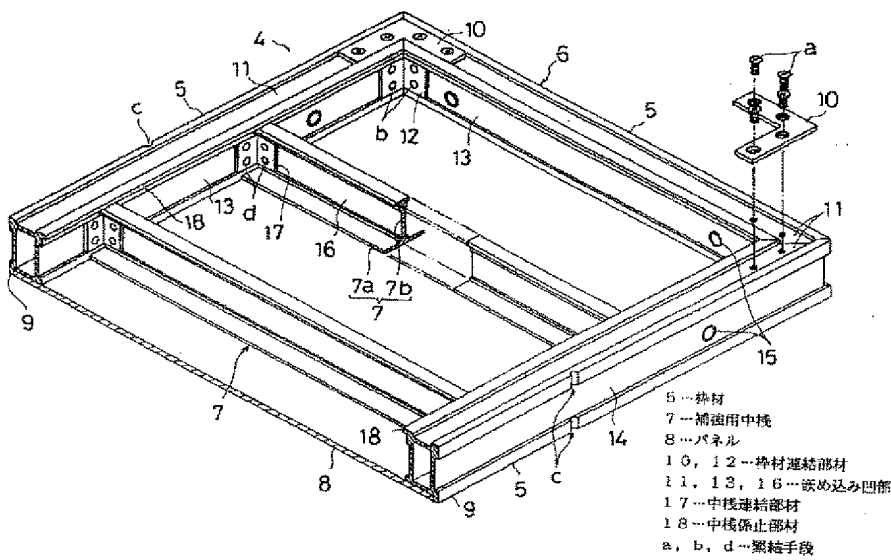
【図2】



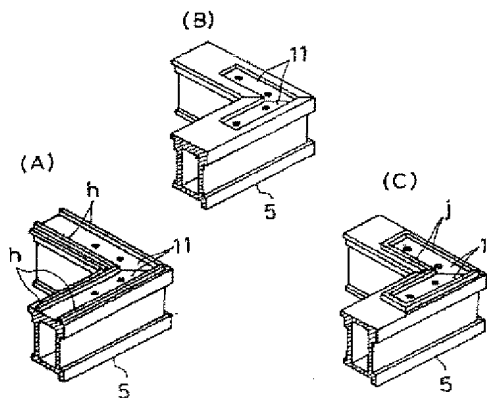
【図10】



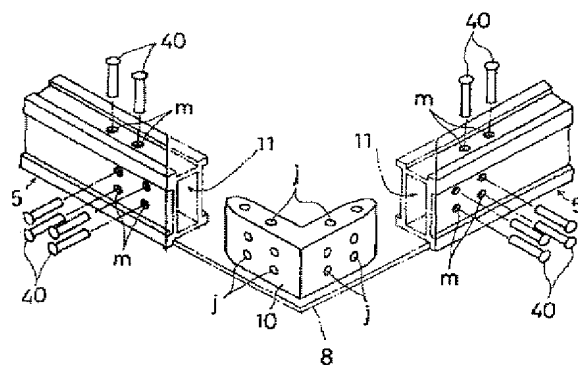
【図3】



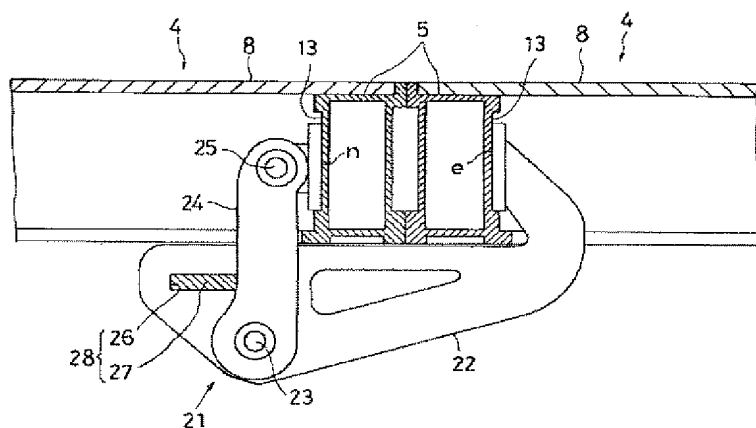
【図11】



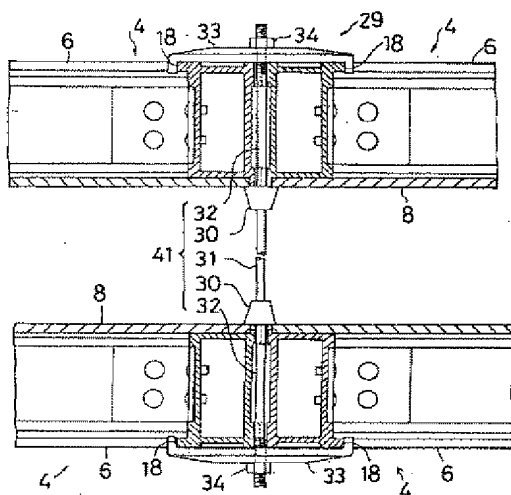
【図12】



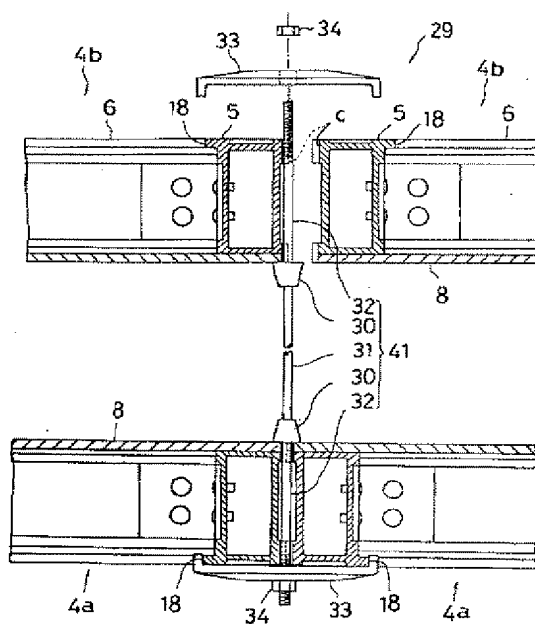
【図6】



【図8】



【図9】



フロントページの続き

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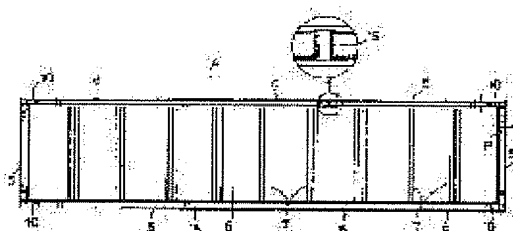
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(54) FORM MATERIAL AND CONCRETE FORM USING THE FORM MATERIAL

(57)Abstract:

PURPOSE: To improve the accuracy and strength of each joined part between fellow form materials, and the form material and a reinforcing middle sash bar, and to facilitate the partial exchange of the form material and the reinforcing middle sash bar in the case where they deform on account of frequent use to sharply elongate their usable life.

CONSTITUTION: A form material connecting member 10 fitted along a recess 11 between adjacent form materials 5 and a middle sash bar connecting member 17 fitted along recesses 13, 16 between a reinforcing middle sash bar 7 and the form material 5 are severally connected by binding means (a), (d). These members are made of metallic material, and provided on the peripheral edge of a panel member 8, and the locking part 18 of the end of the middle sash bar is provided on the form material 5 for connecting the middle sash bar.



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CLAIMS

[Claim(s)]

[Claim 1]A frame material which is a metal frame material which it is provided in a one side face of a panel material, and a ***** thing is mutually connected by a binding means via a frame material connecting member, and constitutes a concrete form, and is characterized by having established an insertion crevice of said frame material connecting member in the whole surface at least.

[Claim 2]A frame material having provided a middle rail suspending portion which is a metal frame material which is formed in an edge part of a one side face of a panel material, and constitutes a concrete form with a middle rail for reinforcement, and stops an end of said middle rail for reinforcement.

[Claim 3]Form a frame material which established an insertion crevice of a frame material connecting member in the whole surface at least in an edge part of a one side face of a panel material, and. A concrete form inserting in a frame material connecting member over a crevice of a ***** thing of this frame material, and having connected this frame material connecting member and said frame material by a binding means.

[Claim 4]Form a frame material which established an insertion crevice of a frame material connecting member in the whole surface at least in an edge part of a one side face of a panel material, and. a frame material connecting member over a crevice of a ***** thing of this frame material, [insert in and] While connecting this frame material connecting member and said frame material by a binding means, an insertion crevice of a middle rail connecting member is established in each of a middle rail for reinforcement, and a frame material covering a predetermined frame material which carries out phase confrontation, A concrete form which a middle rail connecting member inserted in this crevice is connected with a middle rail for reinforcement, and a frame material by a binding means, and is characterized by having provided a suspending portion of a middle rail end in a frame material for middle rail connection.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the frame material used for the concrete form for building the wall made from concrete, a pillar, a beam, a floor, etc., and the concrete form which consists of frame materials.

[0002]

[Description of the Prior Art]As a concrete form for building the wall made from concrete, a pillar, a floor, etc., Mutually, metal frame materials, such as *****, for example, aluminum etc., are connected by welding,

and are assembled, the same for example, metal middle rails for reinforcement, such as aluminum, are connected by welding over the frame material which carries out phase confrontation if needed, and what attached this to the edge part of the rear face of a panel material is known.

[0003]According to the concrete form of ***** composition, in spite of metal, it is comparatively lightweight, and the rigidity of a frame material can be secured, and it has an advantage which can increase a use count compared with the concrete form manufactured by old wooden frame materials.

[0004]

[Problem(s) to be Solved by the Invention]However, in the former, since the gestalt which depends for connection of frame materials or the connection of the middle rail for reinforcement to a frame material on welding was taken, there was a problem which needs the advanced welding technique which prevents distortion of the frame material by the welding heat or a middle rail. Since all the frame materials and middle rails were connected by welding, when a part of frame material and middle rail changed at the time of mold use, since these are selectively unexchangeable, all the concrete forms will be discarded, and there was a problem highly attached in cost.

[0005]When solving the above-mentioned problem, it is possible to connect frame materials or to connect the middle rail for reinforcement with a frame material by a rivet, via a frame material connecting member or a middle rail connecting member, but. In the gestalt only connected by a rivet via a connecting member, the frame material, and the modification proof stress and shear strength of a middle rail over the stress at the time of concrete form use have a problem decided by proof stress of a rivet.

[0006]The concrete form with which this invention consists of metal frame materials, such as a product made from aluminum, and steel, in view of the ***** actual condition, Or the frame material used for the concrete form in which the concrete form with which the middle rail for reinforcement is provided if needed can be assembled easily, and rigidity and endurance are high, and partial exchange of a frame material or a middle rail is moreover possible, It aims at providing the concrete form using the frame material.

[0007]

[Means for Solving the Problem]A frame material by the 1st invention that came to attain the above-mentioned purpose, It is a metal frame material which it is provided in a one side face of a panel material, and a ***** thing is mutually connected by a binding means via a frame material connecting member, and constitutes a concrete form, and the feature is at a point of having established an insertion crevice of said frame material connecting member in the whole surface at least.

[0008]A frame material by the 2nd invention is a metal frame material which is formed in an edge part of a one side face of a panel material, and constitutes a concrete form with a middle rail for reinforcement, and the feature is at a point of having provided a middle rail suspending portion which stops an end of said middle rail for reinforcement.

[0009]The 3rd invention and the 4th invention relate to a concrete form constituted using the above-mentioned mold, and form a frame material by the 3rd invention which established an insertion crevice of a frame material connecting member in the whole surface at least in an edge part of a one side face of a panel material, and. The feature is that inserted in a frame material connecting member over a crevice of a ***** thing of this frame material, and it connected this frame material connecting member and said frame material by a binding means.

[0010]Form a concrete form by the 4th invention in an edge part of a one side face of a panel material, and a frame material which established an insertion crevice of a frame material connecting member in the whole surface at least. a frame material connecting member over a crevice of a ***** thing of this frame material, [insert in and] While connecting this frame material connecting member and said frame material by a binding means, an insertion crevice of a middle rail connecting member is established in each of a middle rail for reinforcement, and a frame material covering a predetermined frame material which carries out phase confrontation, A middle rail connecting member inserted in this crevice is connected with a middle rail for reinforcement, and a frame material by a binding means, and the feature is at a point of having provided a suspending portion of a middle rail end in a frame material for middle rail connection.

[0011]

[Function]Since the frame material connecting member in which a part of stress produced at the time of concrete form use is inserted over the crevice of the ***** thing of a frame material can be made to pay according to the frame material of the 1st invention, Frame materials can be connected without being dependent only on the structural resistance of binding means, such as a rivet, and the accuracy and intensity of a connecting part of a frame material can be improved.

[0012]Since the shearing force produced in the connecting part of a frame material and the middle rail for reinforcement can be easily transmitted to a frame material via a middle rail connecting member according to the frame material of the 2nd invention, the accuracy and intensity of the connecting part can be improved.

[0013]Since according to the concrete form of the 3rd invention it can improve and the connection moreover depends the accuracy and intensity of a connecting part of a frame material on binding means, such as a rivet, partial exchange of a frame material becomes possible easily.

[0014]Since according to the concrete form of the 4th invention not only the connecting part of a frame material but also the accuracy and intensity of a connecting part of a frame material and the middle rail for reinforcement can improve and the connection is moreover based on binding means, such as a rivet, partial exchange of a frame material and the middle rail for reinforcement becomes possible easily.

[0015]

[Example]Hereafter, the example of this invention is described based on a drawing. Drawing 1 shows the form structure of the circumference of a pillar, and is forming successively the mold 2 for beam depth types, and the molds 3 for wall molding to the horizontal flank of the mold 1 for pillar molding.

[0016]The tabular concrete form 4 of the simple substance which constitutes these molds 1-3, So that the frame material 5 made from aluminum fabricated by extrusion and drawing may be connected with a rectangle, the frame 6 may be formed and the frame space of this frame 6 may be divided, as shown also in drawing 2, The middle rail 7 for reinforcement made from aluminum similarly fabricated by extrusion and drawing is formed in one over the frame material 5 and 5 of the long picture which carries out phase confrontation mutually, and the rivet stop of the panel material 8 made of resin for placing concrete is carried out to the one side face part of these frames 6 and the middle rail 7 for reinforcement, for example.

[0017]The frame material 5 and the middle rail 7 for reinforcement can be changed into metal, such as steel, and the panel material 8 is not restricted to the product made of resin, either, and it can change into panel materials, such as wooden. Although the rivet stop of said frame 6 and the middle rail 7 for reinforcement is

carried out to the panel material 8, it can change into a screw stop, attachment by a bolt nut, etc.

[0018]Although the concrete form 4 of the mold 1 for pillar molding is mentioned later, the concrete structure of the frame material 5 used for the molds 2 and 3 the object for beams and for walls, the middle rail 7 for reinforcement, and the concrete form 4 constituted using these is explained based on drawing 2 - 4.

[0019]First, about the frame material 5 which constitutes the frame 6 this frame material 5, A section presents rectangular shape in the air, and he forms successively the panel material protect members 9 for protecting the edge of said resin made panel material 8 in the one side face part by the side of a panel material attachment of that, and is trying to protect the panel material end which is easy to receive a damage in respect of handling.

[0020]And in [cut and compare the both ends of each frame material 5 aslant / 45 /, and] the other lateral portions of an opposite hand with said panel material attachment side, Although the above-mentioned rectangular frame 6 is constituted from a rivet a stop carrying out the tabular frame material connecting member 10 formed in the shape of an L character over the ***** frame materials 5 and 5, Connection of the frame materials 5 and 5 by the frame material connecting member 10 through this rivet a is faced, if the gestalt which makes the frame material connecting member 10 only contact the other lateral portions of the frame material 5 and as for which a rivet a stop carries out it is taken — shearing force with stress (stress shown in drawing 2 by P with an arrow) of a difference by the ***** frame materials 5 and 5 excessive on the rivet a at the time of ***** — ***** — it is necessary to make this rivet a into what has high intensity from things

[0021]In view of the ***** actual condition, the crevice 11 which inserts densely the tabular frame material connecting member 10 for frame material connection in the other lateral portions of an opposite hand as much as possible is formed with the panel material attachment side of the frame material 5 by this invention, After making the frame material connecting member 10 insert in this insertion crevice 11 and making it make the stress by difference of the ***** frame materials 5 and 5 caught by the fitting part by this frame material connecting member 10 and crevice 11, he rivet a Stops and uses said frame material connecting member 10 as the frame material 5, and is trying to improve the rigidity of the frame 6.

[0022]In order to improve the rigidity of the frame 6 of the above-mentioned composition further, the insertion crevice 13 of the frame material connecting member 12 which carries out curvature forming of the tabular member to the shape of an L character is formed in the medial-surface part by the side of frame space formation of said frame material 5, Position gap prevention to the direction which intersects perpendicularly with the panel surface of the ***** frame materials 5 and 5 is aimed at without comparing an inclined end, and inserting in the frame material connecting member 12 over the crevices 13 and 13 of the ***** frame materials 5 and 5, and rivet b Stopping and making this into each frame material 5 and making shearing force applied to this rivet b.

[0023]With the surface part by the side of frame space formation of the frame material 5, the reentrant 14 is formed in the lateral-surface part of an opposite hand, and the crevice c for holes for forming the axopodium insertion hole of a separator (for details, it mentions later based on drawing 8 and 9.) between the ***** frames 6 and 6 is formed in the prescribed spot of the raised part of said reentrant 14 both sides. thus — if means to form the reentrant 14 in the lateral-surface part of the frame material 5, and to form the

crevice c for holes in the raised part of the both sides are taken — a hole — it is simply processible.

[0024]As the prescribed spot of each frame material 5 is made to penetrate the surface part of the inside and the outside, the pipe member 15 is formed in it by the means of welding or a caulking stop, so that a part may be expanded and illustrated to drawing 2.

[0025]On the other hand, the middle rail 7 for reinforcement is what presents the shape of T type which formed Webb 7b successively to the wide flange 7a which supports said resin made panel material 8, The crevice 16 is formed also in Webb 7b of this in the state of putting it in a row to the crevice 13 formed in the medial-surface part of said frame material 5, and the middle rail connecting member 17 which carries out curvature forming of the tabular member to the shape of an L character is inserted in him over both the crevices 13 and 16, and this is rivet d Stopped and made into the frame material 5 and the middle rail 7 for reinforcement. and the medial-surface part by the side of frame space formation of said frame material 5 — and with the panel material attachment side, the middle rail locking members 18 which stop the end of Webb 7b of said middle rail 7 for reinforcement to the part of an opposite hand are formed successively.

[0026]By taking ***** connection composition, ***** stress ** to the middle rail 7 for reinforcement by placing of concrete by being caught with the frame material 5 via said middle rail connecting member 17 and the middle rail locking member 18, Since **** and others becomes that shearing force does not have in said rivet d less, the intensity rise of the connecting part of said frame material 5 and the middle rail 7 for reinforcement is attained.

[0027]The ***** thing of the concrete form 4 of the above-mentioned composition is connected by the fixing machine style 21 shown in drawing 6 outside it is connected with the cylindrical clip 19 shown in drawing 5.

[0028]The cylindrical clip 19 to the end side of the cylindrical portion 19a inserted in the pipe member 15 of the ***** frame materials 5 and 5. It is what bends and forms successively the horseshoe-shaped cylindrical portions 19b which stop to the middle rail locking member 18, and fasten the ***** frame materials 5 and 5 elastically, Said cylindrical portion 19b is inserted in the pipe member 15, and the ***** concrete forms 4 and 4 can be connected by one-touch according to rotating the whole clip 19 caudad and making the middle rail locking member 18 stop the horseshoe-shaped cylindrical portion 19b.

[0029]The 1st locking member 22 provided with the locking tool [as opposed to the crevice 13 of one frame material 5 of the ***** concrete forms 4 and 4 in the fixing machine style 21] e, The 2nd locking member 24 provided with the locking tool n to the crevice 13 of the frame material 5 of another side is connected via the pin 23 of a sliding direction, enabling free rotation, and the cam mechanism 28 which rotates the 1st and 2nd locking members 22 and 24 in the direction which said locking tools e and n are made to approach mutually is established. The cam mechanism 28 consists of the cam groove 26 of formation to the 1st locking member 22, and the cam member 27 which insertion placing is carried out in this cam groove 26, and makes said 2nd locking member 24 rock to the 1st locking member 22 side. The locking tool n of said another side is connected with the 2nd locking member 24 by the circumference of the pin 25 of a sliding direction, enabling free rotation.

[0030]it is important to carry out level appearance of the ***** concrete forms 4 and 4 to a predetermined height position, and to carry out them on the occasion of connection of the ***** concrete form 4 with the above-mentioned cylindrical clip 19 and 4, and the level adjustment means 20 for it is

formed in the lower part side of the concrete form 4.

[0031] This level adjustment means 20 makes the undersurface part and the middle rail locking member 18 of that carry out stop maintenance of the sideways L character-like member 35 to the frame material 5 by the side of the lower part of the concrete form 4, as shown in drawing 7, and. It is what forms the nut 36 and the bore f concentrically with the pipe member 15 by the side of the frame material 5, and makes the bolt 37 for level adjustments screw in said nut 36, and changes, On the occasion of the level adjustment of the concrete form 4, the lower end of the bolt 37 for said level adjustments is shown to spite the angle member 39 arranged via the liner 38 at the mold installation surface part, and level adjustment of the concrete form 4 is performed to it by spirality adjustment of this bolt 37.

[0032] The concrete forms 4 and 4 installed by carrying out phase confrontation mutually are simply connected in the good state of workability by the connecting mechanism 29 shown in drawing 8. This connecting mechanism 29 is what is called a separator (with the member 30 of the cone shape by which metal female screw parts were embedded inside.). The interval regulation member 31 which screws this corn shaped part material 30 in both ends, and regulates a mold interval, 41 which comprises three persons of the axopodium 32 screwed in each cone shape member 30, and the receptacle seat 33 stopped by the middle rail locking member 18 over the ***** frame 6 and the nut 34 screwed in each of the axopodium 32 are comprised, and connection of the concrete forms 4 and 4 which carries out phase confrontation is performed by [as being the next].

[0033] Namely, after carrying out level adjustment by the level adjustment means 20 which constructed wall rod arrangement in the predetermined part, built the ***** concrete forms 4a and 4a one by one by one side of the wall width direction behind as shown in drawing 9, and was shown in drawing 7, It connects by drawing 5, and the cylindrical clip 19 and the fixing machine style 21 which were shown in 6.

[0034] Under the present circumstances, attach the member 30 and the axopodium 32 of cone shape to the both sides of the interval regulation member 31 beforehand, constitute what is called the separator 41, and the axopodium 32 of this separator 41 is pinched, Perform a build lump of the concrete forms 4a and 4a, and receive in one axopodium 32, and the seat 33 is set, The ***** concrete forms 4a and 4a are bound tight, and the separator 41 is made to bind tight and hold between the concrete form 4a and 4a substantially with this receptacle seat 33 and nut 34.

[0035] Thus, when making the separator 41 bind tight and hold between the concrete form 4a and 4a, it is important to set up the formation position of crevice c for holes to said frame material 5 so that an axopodium insertion hole may be formed in the prescribed spot between the ***** concrete form 4a and 4a.

[0036] If a build lump of wall width direction one concrete form 4a is finished, the axopodium 32 of another side of those concrete forms 4a and the separator 41 currently held among 4a will be pinched, Performing connection by the level adjustment and the cylindrical clip 19 by the level adjustment means 20, and the fixing machine style 21, perform a build lump of the concrete form 4b of wall width direction another side like the above, and by this. The connection and the build lump of the concrete forms 4a and 4b which carry out phase confrontation are simply attained by predetermined interval regulating conditions.

[0037] According to the above-mentioned means, the workability of a lump [build] of the concrete forms 4a and 4b is good, and can also perform easily demolition of the concrete forms 4a and 4b. Namely, the

separator of structure equips the both sides of an interval regulation member with corn shaped part material conventionally, And are a thing of composition of making the axopodium screw in the end of the interval regulation member projected from this corn shaped part material, and a build lump of a concrete form is faced, Although covered the concrete form arranged by carrying out phase confrontation, the plate surface of that was made to penetrate the end of an interval regulation member and the connecting mechanism which provides **** in the axopodium screwed on this end was taken, It was very difficult to build a concrete form, making the end of the interval regulation member of a separator insert in the hole formed in the plate surface.

[0038]Since it is in this point, and the axopodium 32 of the separator 41 is made to bind tight and hold between the concrete forms 4a, 4a, and 4b and 4b according to the connecting mechanism of this invention, The connection and the build lump of the concrete forms 4a and 4b which carry out phase confrontation can be performed in the good state of workability, Since a difference of the concrete forms 4a and 4b by the lateral pressure at the time of placing concrete is made to be responded to with the rigid high frame material 5 made from aluminum and he is trying to distribute it, it needs conventionally, and the abbreviation of **** is also attained, and demolition of the concrete forms 4a and 4b is also attained easily.

[0039]Next, the frame material 5 which will be used for this concrete form 4 as shown in drawing 10 if the concrete form 4 of the mold 1 for pillar molding is explained, The section which comprises the fitting flange 5a of the resin made panel material 8 and Webb 5b is a thing made from L type-like aluminum, Form successively the panel material protect members 9 for protecting the edge of said resin made panel material 8 in the one side face part by the side of a panel material attachment, and. With the surface part by the side of frame space formation, the crevice c for holes for the concrete form connection which forms the reentrant 14 in the lateral-surface part of an opposite hand, and carries out phase confrontation at the raised part of these reentrant 14 both sides is formed.

[0040]And although a graphic display in particular is not carried out, connect this frame material 5 with a rectangle, and a frame is formed, The middle rail for reinforcement made from aluminum is provided in one over the frame material of the long picture of a frame which carries out phase confrontation so that the frame space of this frame may be divided, The concrete form 4 of the mold 1 for pillar molding is constituted by carrying out the rivet stop of the resin made panel material for placing concrete to the one side face part of these frames and the middle rail for reinforcement, for example.

[0041]Although the explanation about connection of the ***** concrete form 4 of this mold 1 for pillar molding and the concrete forms 4 and 4 which carry out phase confrontation with connection of four is omitted, It is compositionally [as drawing 5, the clip 19 shown in 6 and 8 and the fixing machine style 21, and the connecting mechanism 29] the same, and it will be understood easily that connection is attained.

[0042]Although the insertion crevice 11 of the frame material connecting member 10 is formed in a groove in the above-mentioned example, As shown in drawing 11 (A), form the crevice 11 by the raised part h covering the overall length of the frame material 5, or. Although the frame material 5 can be fabricated by neither extrusion nor drawing, as shown in drawing 11 (B), the thing which limited to the circumference of a frame material connecting member, and formed the crevice 11, or limited to the circumference of a frame material connecting member as shown in drawing 11 (C) and for which it raised-part i Depends and the crevice 11 is formed is possible.

[0043]Although said frame material connecting member 10 is considered as the composition inserted in the insertion crevice 11 which carried out other lateral portion formation with the panel material attachment side of the frame material 5 in the opposite hand, As shown in drawing 12, the hollow sections of the frame material 5 which cuts an end at 45 degrees and is connected are made into the insertion crevice 11 of the frame material connecting member 10, The inner substance in which the rivet insertion hole j was formed in this crevice 11, or the frame material connecting member 10 in the air is inserted in densely, and the hole beforehand corresponding to said rivet insertion hole j in the frame material 5 — m being formed and, It is also possible to take three persons of the frame material connecting member 10, the frame material 5, and the resin made panel material 8 or the means which carry out the connecting lock of the two persons of the frame material 5 and the frame material connecting member 10 by the rivet 40 suitably in the plane direction of the panel material 8 in the thickness direction of the panel material 8.

[0044]Although the frame material connecting member 12 is considered as the composition inserted in the crevice 13 in the inside of the stiffener frames 6 and 6, operation with the gestalt which inserts in the frame material connecting member 12 in the state of engrossing the reentrant 14 in the outside corner of the stiffener frames 6 and 6 here as an insertion crevice of the frame material connecting member 12 is also possible.

[0045]Although it is because this is lightweight and excellent in the field of handling, although said frame material 5 and the middle rail 7 for reinforcement are made into the product made from aluminum, If these were made into metal, the construction material of the metal is not specified, and made the sectional shape the approximately square O shape about the frame material 5, and considered it as approximately T type about the middle rail 7 for reinforcement, but. I form, H form, L form, the type of KO, a trapezoid, and other ***** may be sufficient, and it cannot be overemphasized that it is not what is limited to specific shape.

[0046]When the example of the gestalt which assembles the frame material 5 rectangularly was shown, it compared by cutting the end of the frame material 5 aslant [45], but when the shape of the concrete form 4 is a polygon, it cannot be overemphasized that the end cutting angle of the frame material 5 is changed and compared according to the shape, either.

[0047]Although explained by carrying out the rivet stop of each connection of the middle rail connecting member 17 to the connection of the frame material connecting members 10 and 12 to the frame materials 5 and 5, and the frame material 5 and the middle rail 7 for reinforcement, This is only an example, it could change into connection by the screw stop or a bolt nut, etc., and such connecting mechanisms are named the binding means generically in this invention.

[0048]

[Effect of the Invention]Since the frame material connecting member in which a part of stress produced at the time of concrete form use is inserted over the crevice of the ***** thing of a frame material can be made to pay as explained above according to the frame material of the 1st invention, Frame materials can be connected without being dependent only on the structural resistance of binding means, such as a rivet, and the accuracy and intensity of a connecting part of a frame material can be improved.

[0049]Since the shearing force produced in the connecting part of a frame material and the middle rail for reinforcement can be easily transmitted to a frame material via a middle rail connecting member according to the frame material of the 2nd invention, the accuracy and intensity of the connecting part can be

improved.

[0050] Since according to the concrete form of the 3rd invention it can improve and the connection moreover depends the accuracy and intensity of a connecting part of a frame material on binding means, such as a rivet, Partial exchange of a frame material when some frame materials change at the time of mold use becomes possible easily, and the cost cut of a concrete form is substantially attained because the use life of a concrete form rises substantially.

[0051] Since according to the concrete form of the 4th invention not only the connecting part of a frame material but also the accuracy and intensity of a connecting part of a frame material and the middle rail for reinforcement can improve and the connection is moreover based on binding means, such as a rivet, Partial exchange of these frame materials and the middle rail for reinforcement when a part of frame material and middle rail for reinforcement change at the time of mold use becomes possible easily, and the cost cut of a concrete form is substantially attained because the use life of a concrete form rises substantially.

[Translation done.]